Volunteer Lake Assessment Program Individual Lake Reports

PAWTUCKAWAY LAKE, NOTTINGHAM, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	13,248	**Max. Depth (m):**	15.2	**Flushing Rate (yr^{-1}):**	2.3
Surface Area (Ac.):	900	**Mean Depth (m):**	2.9	**P Retention Coef:**	0.61
Shore Length (m):	27,700	**Volume (m^3):**	10,740,000	**Elevation (ft):**	250

TROPHIC CLASSIFICATION

Year	Trophic class
1989	MESOTROPHIC
1998	MESOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

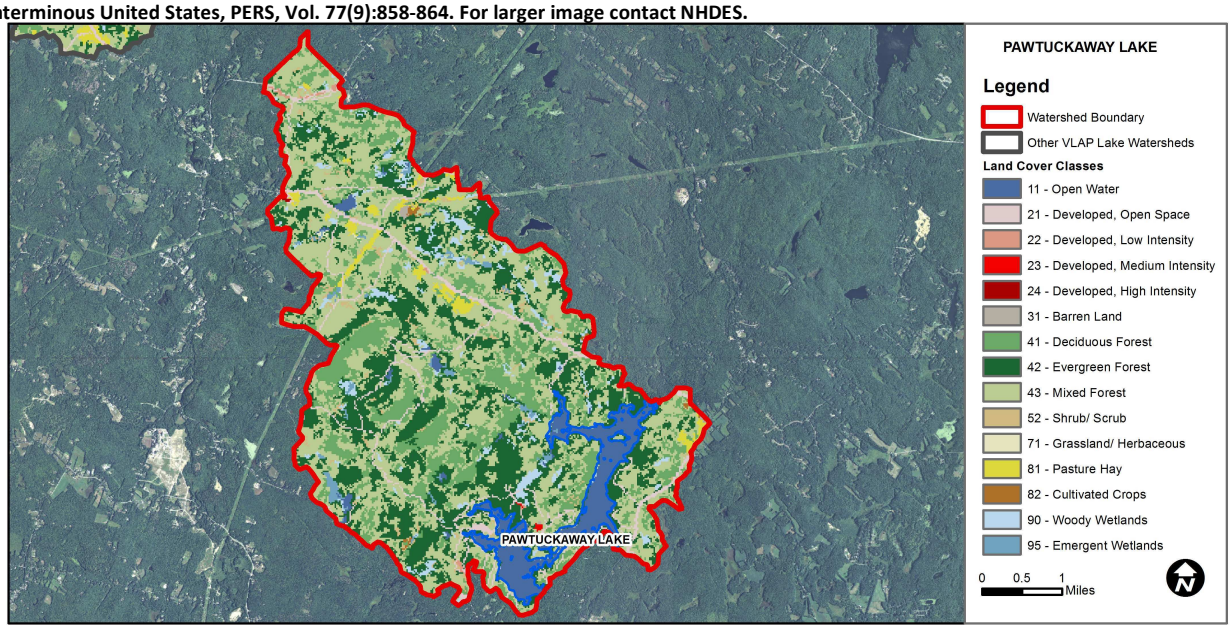
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Good	At least 10 samples with 1 sample but < 10% of samples exceeding criteria.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	No Data	No Data for this parameter.
	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Good	At least 10 samples with 1 sample but < 10% of samples exceeding criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

PAWTUCKAWAY LAKE - TOWN BEACH	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.
PAWTUCKAWAY LAKE - PAWTUCKAWAY STATE PARK BEACH	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.
PAWTUCKAWAY LAKE - PAWTUCKAWAY STATE PARK BEACH	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.

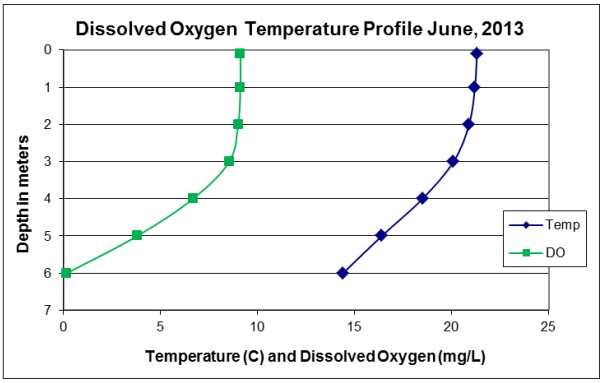


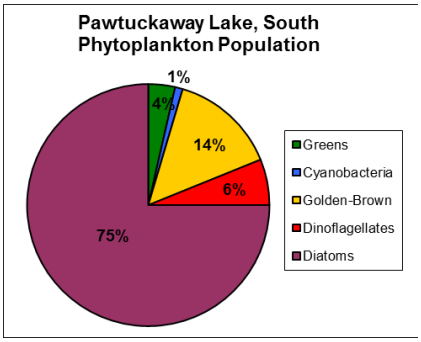
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	6.52	Barren Land	0.09	Grassland/Herbaceous	0.06
Developed-Open Space	4.12	Deciduous Forest	16.26	Pasture Hay	1.5
Developed-Low Intensity	0.19	Evergreen Forest	26.59	Cultivated Crops	0.16
Developed-Medium Intensity	0.05	Mixed Forest	38.87	Woody Wetlands	3.15
Developed-High Intensity	0.02	Shrub-Scrub	1.49	Emergent Wetlands	0.92

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
PAWTUCKAWAY LAKE, SOUTH STN, NOTTINGHAM, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were slightly elevated in May and June but decreased to lower levels during the remainder of the summer. Historical trend analysis indicates relatively stable chlorophyll with moderate variability between years.
- **CONDUCTIVITY/CHLORIDE:** Average conductivity and chloride were approximately equal to the state medians. Conductivity was elevated in Mountain Bk. in July following significant storm event. Historical trend analysis indicates stable epilimnetic conductivity with low variability between years.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels were elevated in May and July. Lake levels were low in May potentially concentrating nutrients which contributed to elevated phosphorus and chlorophyll. Mountain Brook phosphorus was elevated in July and the turbidity was also elevated. Significant storm event occurred during tributary sampling and two days prior to deep spot sampling and may have contributed phosphorus from stormwater runoff. Historical trend analysis indicates relatively stable eplimnetic phosphorus with moderate variability between years.
- **TRANSPARENCY:** Viewscope transparency was stable throughout the summer and peaked in August when chlorophyll levels were lowest. Volunteers switched to utilizing the viewscope method to measure transparency (2007-2013); therefore we need at least ten consecutive years of data to conduct statistical trend analysis of viewscope data.
- **TURBIDITY:** Epilimnetic turbidity was higher than average in May, likely due to elevated algal growth and low water levels. Hypolimnetic turbidity increased as the summer progressed. Mountain Brook turbidity was greatly elevated in July following significant storm event while sampling indicating potential areas of erosion in the tributary sub-watershed.
- **PH:** Hypolimnetic and Mountain Bk. pH levels were lower than desirable range 6.5 – 8.0 units. Historical trend analysis indicates stable epilimnetic pH with low variability between years.
- **RECOMMENDED ACTIONS:** Significant storm events in July resulted in severely elevated turbidity in Mountain Bk.. Identify areas of erosion in the sub-watershed and implement best management practices to stabilize soils and prevent erosion during storm events. Consult a Certified Erosion Control Specialist for assistance in identifying these areas. Educate and work with the State Park, lake and watershed residents on installing stormwater best management practices to reduce stormwater runoff from their properties. Keep up the great work!





Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m	Turb. ntu	pH
						VS		
Mountain Brook			3	48.9	29		25.93	6.50
South Epilimnion	5.84	4.81	6	44.1	17	3.71	0.97	6.64
South Hypolimnion				44.9	17		1.79	6.21

Table 1. 2013 Average Water Quality Data for PAWTUCKAWAY LAKE, SOUTH

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significant; data show low variability.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
Conductivity	Stable	Trend not significant; data show low variability.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.